What is claimed is:

1. A semiconductor laser comprising:

a) a bottom reflector;

b) a top reflector; and

c) a cavity located between the bottom reflector and the top reflector comprising an active region located within the cavity, wherein the cavity and the active region are designed such that light propagates in the cavity in a direction tilted both normal to a lateral plane and with respect to the lateral plane itself.

2. The semiconductor laser of claim 1, further comprising a substrate below the bottom reflector.

3. The semiconductor laser of claim 2, wherein:

a) the active region emits light when exposed to an injection current when a forward bias is applied; and

b) the cavity further comprises:

i) a first confinement region below the active region;

ii) a second confinement region above the active region;

iii) a first n-doped current spreading region above the substrate and below the first confinement region;

iv) a first p-doped current spreading region above the second confinement region and below the top reflector;

v) a current aperture placed between each neighboring region; and

vi) a bias control device between the first n-doped current spreading region and the first p-doped current spreading region such that current can be injected into the active region to generate light.

4. The semiconductor laser of claim 1, wherein the active region is selected from the group consisting of:

a) at least one quantum well;

b) at least one sheet of quantum wires;

c) at least one sheet of quantum dots; and

d) any combination of a) through c).

5. The semiconductor laser of claim 4, further comprising a feedback mechanism.

6. The semiconductor laser of claim 1, wherein the bottom reflector and the top reflector are multilayered.

7. The semiconductor laser of claim 6, wherein:

a) the cavity further comprises at least one layer having a high refractive index, and at least one layer having an intermediate refractive index;

b) the bottom reflector comprises a topmost layer having a high refractive index; and

c) the top reflector comprises a bottommost layer having a high refractive index.

8. The semiconductor laser of claim 7, wherein the active region is located within the layer having a high refractive index.

9. The semiconductor laser of claim 7, wherein the active region is located within the layer having an intermediate refractive index.

10. The semiconductor laser of claim 6, wherein:

a) the cavity further comprises at least one layer having a low refractive index and at least one layer having an intermediate refractive index;

b) the bottom reflector comprises a topmost layer having a high refractive index; and

c) the top reflector comprises a bottommost layer having a high refractive index.

11. The semiconductor laser of claim 10, wherein the active region is located within the layer having a low refractive index.

12. The semiconductor laser of claim 10, wherein the active region is located within the layer having an intermediate refractive index.

13. The semiconductor laser of claim 10, wherein the active region is located between the layer having a low refractive index and the layer having an intermediate refractive index.

14. The semiconductor laser of claim 1, wherein the laser emits light in a vertical direction, such that the laser acts as a surface emitting laser.

15. The semiconductor laser of claim 14, further comprising an optical aperture, which allows the generated light to come out of the structure.

16. The semiconductor laser of claim 15, wherein the optical aperture is made by partial selective removal of several layers of the top reflector.

17. The semiconductor laser of claim 15, wherein the optical aperture is made by an additional layer located on top of the top reflector.

18. The semiconductor laser of claim 1, wherein the laser emits light in a lateral direction, such that the laser acts as an edge-emitting laser.

19. The semiconductor laser of claim 1, wherein the feedback in the vertical direction is provided by multi-layered bottom and top reflectors.

20. The semiconductor laser of claim 1, wherein the top reflector comprises a single layer and the bottom reflector comprises multiple layers, such that the reflectors provide feedback in a vertical direction.

21. The semiconductor laser of claim 1, wherein the top reflector comprises multiple layers and the bottom reflector comprises a single layer, such that the reflectors provide feedback in a vertical direction.

22. The semiconductor laser of claim 1, wherein the top reflector and the bottom reflector each comprise a single layer, thus providing feedback in a vertical direction.

23. The semiconductor laser of claim 22, in which a tilted optical mode is tilted normal to the layers at an angle larger than the angle of a total internal reflection both at a boundary between the cavity and the top reflector, and a boundary between the cavity and the bottom reflector.

24. The semiconductor laser of claim 1, wherein the cavity further comprises at least one mirror on each side of the cavity which provide feedback in a lateral direction.

25. The semiconductor laser of claim 1, wherein the top reflector is partially etched to provide a distributed feedback in a lateral direction.

26. The semiconductor laser of claim 1, further comprising a grating fabricated above the top reflector, wherein the grating provides a distributed feedback in a lateral direction.

27. The semiconductor laser of claim 3, further comprising:

d) an absorbing element sitting on top of the top reflector, wherein the absorbing element includes an absorbing region which absorbs light transmitted through the top reflector.

28. The semiconductor laser of claim 3, further comprising:

d) an absorbing element sandwiched between the substrate and the bottom reflector, wherein the absorbing element includes an absorbing region which absorbs light transmitted through the bottom reflector.

29. The semiconductor laser of claim 3, further comprising:

d) a phase control element comprising:

i) a modulating region located above the first p-doped current spreading region, wherein the modulating region uses an electro-optical effect to modulate a wavelength of light;

ii) a second n-doped current spreading region above the modulating region;

iii) a current aperture placed between each neighboring region of the phase control element; and

iv) a phase control element bias control device between the second n-doped current spreading region and the first p-doped current spreading region such that an electrical field can be created for the modulating region to modulate the wavelength of light.

30. The semiconductor laser of claim 29, wherein the modulating region modulates the wavelength of light when it is exposed to an electric field when a reverse bias is applied.

31. The semiconductor laser of claim 30, further comprising an optical aperture, which allows the generated light to come out of the structure.

32. The semiconductor laser of claim 31, in which the optical aperture is made by partial selective removal of several layers of the top reflector.

33. The semiconductor laser of claim 31, wherein the optical aperture is made by an additional layer located on top of the top reflector.

34. The semiconductor laser of claim 30, further comprising an absorbing element including an absorbing region placed on top of the top reflector to provide a light output in a lateral direction.

35. The semiconductor laser of claim 29, wherein the modulating region modulates the wavelength of light when it is exposed to an injection current when a forward bias is applied.

36. The semiconductor laser of claim 35, further comprising an optical aperture, which allows the generated light to come out of the structure.

37. The semiconductor laser of claim 36, wherein the optical aperture is made by partial selective removal of several layers of the top reflector.

38. The semiconductor laser of claim 36, wherein the optical aperture is made by an additional layer sitting on top of the top reflector.

39. The semiconductor laser of claim 36, further comprising an absorbing element including an absorbing region placed on top of the top reflector to provide a light output in a lateral direction.

40. The semiconductor laser of claim 29, further comprising:

e) a power modulating element including:

i) a first absorbing region located above the second n-doped current spreading region, wherein the first absorbing region uses an electro-optical effect to modulate an absorbed power;

ii) a second p-doped current spreading region above the first absorbing region;

iii) a current aperture placed between each neighboring region of the power modulating element; and

iv) a power modulating element bias control device between the second n-doped current spreading region and the second p-doped current

spreading region such that an electrical field can be created that causes the first absorbing region to shift a spectral position of an absorption peak thus modulating an absorption at a given wavelength of the emitted light.

41. The semiconductor laser of claim 40, wherein the first absorbing region is exposed to an electric field when a reverse bias is applied.

42. The semiconductor laser of claim 41, further comprising an optical aperture, which allows the generated light to come out of the structure.

43. The semiconductor laser of claim 41, further comprising an absorbing element including a second absorbing region located on top of the top reflector to provide a light output in a lateral direction.

44. The semiconductor laser of claim 40, wherein the first absorbing region is exposed to an injection current when a forward bias is applied.

45. The semiconductor laser of claim 44, further comprising an optical aperture which allows the generated light to come out of the structure.

46. The semiconductor laser of claim 44, further comprising an absorbing element including a second absorbing region located on top of the top reflector to provide a light output in a lateral direction.

47. The semiconductor laser of claim 3, further comprising

d) a power modulating element including:

i) a first absorbing region located above the first p-doped current spreading region, wherein the absorbing region uses an electro-optical effect to modulate an absorbed power;

ii) a second n-doped current spreading region above the absorbing region;

iii) current apertures placed between each neighboring region; and

iv) a power modulating element bias control device between the second n-doped current spreading region and the first p-doped current spreading region such that an electrical field can be created that causes the absorbing region to shift a spectral position of an absorption peak thus modulating an absorption at a given wavelength of light.

48. The semiconductor laser of claim 47, wherein the first absorbing region modulates the absorbed power when it is exposed to an electric field when a reverse bias is applied.

49. The semiconductor laser of claim 48, further comprising an optical aperture, which allows the generated light to come out of the structure.

50. The semiconductor laser of claim 49, wherein the optical aperture is made by partial selective removal of several layers of the top reflector.

51. The semiconductor laser of claim 50, wherein the optical aperture is made by an additional layer located on top of the top reflector.

52. The semiconductor laser of claim 48, further comprising an absorbing element including a second absorbing region located on top of the top reflector to provide a light output in a lateral direction.

53. The semiconductor laser of claim 47, wherein the absorbing region is exposed to an injection current when a forward bias is applied.

54. The semiconductor laser of claim 53, further comprising an optical aperture, which allows the generated light to come out of the structure.

55. The semiconductor laser of claim 54, wherein the optical aperture is made by partial selective removal of several layers of the top reflector.

56. The semiconductor laser of claim 54, wherein the optical aperture is made by an additional layer located on top of the top reflector.

57. The semiconductor laser of claim 53, further comprising an absorbing element including a second absorbing region located on top of the top reflector to provide a light output in a lateral direction.

58. The semiconductor laser of claim 1, wherein one reflector is a multi-layered reflector, and the other reflector is a single-layered reflector.

59. The semiconductor laser of claim 58, wherein the bottom reflector is a single-layered reflector, and the top reflector is a multi-layered reflector.

60. The semiconductor laser of claim 59, wherein the tilted optical mode is tilted to the normal to the layers at an angle larger than the angle of the total internal reflection at a boundary between the cavity and the bottom reflector.

61. The semiconductor laser of claim 58, wherein the bottom reflector is a multi-layered reflector, and the top reflector is a single-layered reflector.

62. The semiconductor laser of claim 61, wherein the tilted optical mode is tilted to the normal to the layers at an angle larger than the angle of the total internal reflection at a boundary between the cavity and the top reflector.

63. The semiconductor laser of claim 3, wherein the active region is located at a local maximum of intensity of the resonant tilted optical mode.

64. The semiconductor laser of claim 29, wherein the modulating region is located at a local maximum of intensity of the resonant tilted optical mode.

65. The semiconductor laser of claim 29, wherein both the active region and the modulating region are located at local maxima of intensity of the resonant tilted optical mode.

66. The semiconductor laser of claim 47, wherein the absorbing region is placed at a local maximum of intensity of the resonant tilted optical mode.

67. The semiconductor laser of claim 47, wherein both the active region and the absorbing region are placed at local maxima of intensity of the resonant tilted optical mode.

68. The semiconductor laser of claim 40, wherein the active region, the modulating region, and the absorbing region are placed at local maxima of intensity of the resonant tilted optical mode.

69. The semiconductor laser of claim 3, wherein the cavity further comprises:

vii) a modulating region placed above the first p-doped current spreading region; and

viii) a current aperture placed between the first p-doped current spreading region and the modulating region.

70. The semiconductor laser of claim 69, wherein the modulating region comprises a modulating layer exhibiting an absorption peak in a spectral region close to a spectral line of generated light.

71. The semiconductor laser of claim 70, wherein the modulating layer is designed such that a resonance decrease of its refractive index with an increase in temperature compensates an average non-resonant increase of an effective refractive index of the cavity thus providing an additional stabilization of a linewidth of emitted light against temperature variations.

72. The semiconductor laser of claim 71, wherein the modulating layer is placed at a local maximum of the resonant tilted optical mode.

73. The semiconductor laser of claim 71, wherein both the active region and the modulating layer are placed at local maxima of the resonant tilted optical mode.

74. A photodetector comprising:

a) a bottom reflector;

b) a top reflector; and

c) a cavity located between the bottom reflector and the top reflector comprising a light absorbing region located within the cavity, wherein the cavity is designed such that a direction of propagation of light in the resonant optical

mode of the cavity is tilted both normal to a lateral plane and with respect to the lateral plane itself.

75. The photodetector of claim 74, further comprising a substrate below the bottom reflector.

76. The photodetector of claim 75, wherein:

a) the light absorbing region generates electron-hole pairs when absorbing light; and

b) the cavity further comprises:

i) a first confinement region below the light absorbing region;

ii) a second confinement region above the light absorbing region;

iii) a first n-doped current spreading region above the substrate and below the first confinement region;

iv) a first p-doped current spreading region above the second confinement region and below the top reflector;

v) a current aperture placed between each neighboring region; and

vi) a bias control device between the first n-doped current spreading region and the first p-doped current spreading region such that electrons and holes created by the absorption of light in the light absorbing layer generate photocurrent in an external circuit.

77. The photodetector of claim 76, wherein the photodetector detects light coming from the vertical direction.

78. The photodetector of claim 76, wherein the photodetector detects light coming from the lateral direction.

79. An amplifier comprising:

a) a bottom reflector;

b) a top reflector; and

c) a cavity located between the bottom reflector and the top reflector comprising an active region located within the cavity, wherein the cavity is designed such that a direction of propagation of light in the resonant optical mode of the cavity is tilted both normal to a lateral plane and with respect to the lateral plane itself.

80. The amplifier of claim 79, further comprising a substrate below the bottom reflector.

81. The amplifier of claim 80, wherein:

a) the active region amplifies light when exposed to an injection current when a forward bias is applied; and

b) the cavity further comprises:

i) a first confinement region below the active region;

ii) a second confinement region above the active region;

iii) a first n-doped region above the substrate and below the first confinement region;

iv) a first p-doped region above the second confinement region and below the top reflector; and

v) a bias control device between the first n-doped current spreading region and the first p-doped current spreading region such that current can be injected into the light generating layer to amplify light.

82. The amplifier of claim 80, wherein the substrate is n-doped, the bottom reflector is n-doped, and the top reflector is p-doped.

83. The amplifier of claim 82, further comprising:

d) an n-contact located below the substrate; and

e) a p-contact located above the top reflector.

84. The amplifier of claim 83, wherein the p-contact is rotated in the lateral plane with respect to a lateral direction of propagation of the tilted optical mode, such that the amplifier does not operate as a laser.

85. The semiconductor laser of claim 1, wherein only a part of the laser structure is formed from a tilted cavity.

86. The semiconductor laser of claim 1, wherein at least one side surface of the tilted cavity is covered by a coating selected from the group consisting of a single-layer coating; and a multiple-layer coating;

wherein the coating controls a light output in the lateral direction.

87. The semiconductor laser of claim 1, wherein at least one optical fiber is attached in a near field zone of an electromagnetic field in a vicinity of a side surface of the cavity thus providing coupling of a resonant optical mode of the cavity to the optical fiber.

88. The semiconductor laser of claim 1, wherein at least one optical fiber is attached in a near field zone of an electromagnetic field in a vicinity of a top surface of the top reflector, thus providing coupling of a resonant optical mode of the cavity to the optical fiber.

89. The semiconductor laser of claim 1, wherein at least one optical fiber is attached in a near field zone of an electromagnetic field on top of a top surface of the top reflector, thus providing coupling of a resonant optical mode of the cavity to the optical fiber.

90. An optical fiber comprising:

a) a core; and

b) a multilayered coating designed such that only light in a certain interval of wavelengths can propagate, thus providing a wavelength-stabilized system.